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B P I S A E

RESEARCH ACTIVITIES

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PLANT INDUSTRY STATION, BELTSVILLE, MD.

DECEMBER 1948

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Soil Management for Corn Production

Speaking before the Hybrid Seed Division of the American Seed Trade Association meeting in Chicago, December 2, Dr. Robert M. Salter, chief of the Bureau said:

"High corn levels of the past 10 years have come about not because of increases in soil productivity but rather in spite of decreases in soil productivity.

"Advances in breeding, fertilization, disease control, and mechanization have been so great that they have temporarily more than compensated for soil depletion. Improved technology cannot, in my opinion, continue to carry the load. Farmers of the Midwest must awake to the situation and take prompt measures to stem soil depletion. Otherwise yields will start down and production costs will go up.

"The obvious answer is to devote more land to such soil building crops as alfalfa, sweetclover, and the other clovers alone or in combination with grass. Furthermore this must be done under a balanced system of soil management, including proper care and return of crop residues and manure, use of fertilizer and lime to the economic maximum, and the adoption where needed of such erosion preventive measures as contour cultivation, strip cropping, and terracing.

"That such a shift can be made without sacrifice in total corn production is entirely possible, I believe. The higher yields that can be achieved by employing advanced technology should make possible release of the acres needed for growing soil building legumes, and these in turn will contribute notably toward achieving the needed higher yields of corn.

"In striving for higher yields of corn, which certainly are possible, we can employ methods that will make possible sustained production at these new high levels."

(Mimeographed copies of the complete speech can be obtained from the Information Division, Plant Industry Station, Beltsville, Md.)

Fertilizer Division—New in Bureau, Old in Department

The Division of Fertilizer and Agricultural Lime, set up last year under the direction of Kenneth D. Jacob, can trace its beginnings back to 1829 when a chemist in the Patent Office made analyses of manures and other soil amendments. It was not until 1906, however, that the study of fertilizers was formally undertaken in the Department. The first specific appropriation for research in this line was made in 1911.

Early objectives were to locate natural sources of potash, nitrogen, and phosphate. Department workers pioneered jointly with the Geological Survey in the discovery of potash at Searles Lake, Calif. and in other sections. They carried on early work in the synthetic production of ammonia and in the development of furnace methods for producing phosphoric acid from phosphate rock. In recent years, the objectives have been broadened to include improvement in the quality and physical properties of fertilizer. Soil scientists and agricultural engineers of the Department initiated fertilizer-placement studies, developed a process for the granulation of fertilizers, showed the value of double-strength fertilizers, the costly practice of using inert fillers, and worked out details for processing ammonium nitrate to permit its use as fertilizer.

The work was conducted first in the Bureau of Soils, later in the Bureau of Chemistry and Soils, and since 1939 in this Bureau.

At present the Division is cooperating with State experiment stations in making (a) vegetative tests of fertilizers in greenhouse and field plots and (b) statistical studies of fertilizer use. It is cooperating with the Association of Official Agricultural Chemists, the Association of American Fertilizer Control Officials, and representatives of the fertilizer industry in studying new developments for improving fertilizer.

This past year, scientists in the Division made about 700 pounds of radioactive products for use in tracer tests. They used potassium dihydrogen phosphate from Oak Ridge, Tenn., in the manufacture of radioactive superphosphate, ammoniated superphosphate, anhydrous dicalcium phosphate, hydrated tricalcium phosphate, alpha tricalcium phosphate, and calcium metaphosphate.

A survey of the insoluble nitrogen content of 132 samples of commercial-mixed fertilizers supplied by officials of 5 Southeastern States showed a wide range in efficiency in promoting crop growth--of from 25 to 65 percent of that of ammonium sulfate, with an average for all samples of less than 47 percent.

In plant-scale and laboratory tests conducted cooperatively with a fertilizer producer, scientists of the Division recently showed that the addition of an organic conditioning agent to ammoniated mixtures at bagging time is more effective in promoting good physical condition of the product than the addition of the conditioner before ammoniation and prior to curing. Low temperature of the mixtures at bagging time also contributed to improved condition.

Effect of Heat on Milk Production

That Holstein-Friesians are more sensitive than Jerseys to high environmental temperatures is indicated in early findings of tests conducted jointly by the Division of Farm Buildings and Rural Housing and the Missouri Agricultural Experiment Station in the psychro-energetic laboratory at Columbia, Mo.

Six cows--three lactating Jerseys, two lactating Holsteins-Friesians, and one non-lactating, nonpregnant Holstein-Friesian were kept in each of two chambers of the Laboratory for about 5 months. For the six cows in one chamber all environmental conditions were maintained constant for the period. For the six cows in the other, all conditions were kept constant except temperature, which was changed to higher levels at relatively long intervals. The range was from 50° to 105° F.

The Holstein-Friesians showed losses in milk production, feed consumption, and body weight when the temperatures were from 75° to 80° F. The Jerseys showed losses when the temperatures were kept from 80° to 85° F. The laboratory staff believes that the greater sensitiveness of Holstein-Friesians to higher temperatures is due more to the heavier weights than to the breed. Heat is dissipated through body surfaces and the amount of surface per unit body weight decreases with increasing body weight.

Two-in-One Survey

Soil surveys designed to meet the needs of more than one agency may be made cooperatively at less cost and with greater efficiency than when each agency works independently in the same area.

That is the consensus of representatives of this Bureau, the North Dakota Agricultural College, and the Bureau of Reclamation, meeting recently in Kenmore, N. Dak. Purpose of the meeting was to review the results of a trial land classification and soil survey made cooperatively this past summer in a selected area of the Missouri-Souris Unit in North Dakota. They agreed that details of a cooperative survey procedure can be worked out. A joint report is now being prepared.

Production of Carrot and Onion Seed

Much closer spacing and fewer irrigations that are normally considered necessary in the commercial production of carrots and onions for seed are conducive to higher yields. That is indicated in a cooperative study made at Logan, Utah, by Leslie R. Hawthorn and Dr. Omer J. Kelley of the Bureau and Dr. L. H. Pollard of the Utah Experiment Station.

Corn Hybrids Resist Diseases and Insects

Appreciable progress has been made toward developing corn hybrids to meet certain disease and insect problems, reports Dr. Merle T. Jenkins, Division of Cereal Crops and Diseases. He cites the following examples:

The Indiana inbred line P8, which is used to produce Indiana hybrid 816A, transmits cornborer tolerance to its hybrids. When tested under heavy borer infestation produced artificially, the hybrid Indiana 816A has consistently had fewer broken stalks than has the widely grown hybrid U. S. 13. Evidence shows that corn borer moths favor certain inbred lines over others for depositing eggs and that more larvae are likely to survive on some lines than on others.

The Illinois inbred line R4 is highly resistant to aphid attack. Louisiana hybrid 1030 is the most earworm-resistant hybrid yet tested in the South. The North Carolina inbred line NC7 has an extensive system of fibrous roots that makes it resistant to damage by root worms.

Pointing out that these are the first inbred lines and hybrids to receive intensive selection for specialized characters, Dr. Jenkins says that viewed from this perspective great possibilities must still exist for the future improvement of corn hybrids.

Subsoil Fumigation Beneficial in Peach Tests

Tests at Tifton, Ga., indicate that fumigation of peach planting sites in circles 6 feet in diameter and to a depth of 18 inches produces superior results in the control of root-knot nematode disease.

John H. Machmer of the Division of Nematology Investigations reports that peach trees on sites that had been thus treated had trunks measuring an average of 3.72 inches in diameter as against the 2.30 inches of trees on sites not fumigated. Treated sites produced an initial crop of 128 pounds of peaches compared with 30 pounds from nonfumigated sites.

A determination will be made to find whether treatments of this type will be adequate for long-term benefits.

New Treatment Controls Walnut Blight

Walnut bacterial blight can be controlled in the commercial orchards of western Oregon by weekly treatments with a monohydrated copper sulfate plus lime plus sulfur dust, reports Dr. Paul W. Miller, Fruit and Vegetable Crops and Diseases. The treatment, which was worked out jointly by Dr. Miller and staff members of the Oregon Agricultural Experiment Station, should be applied at the beginning of the early prebloom state and continued for 5 or 6 weeks.

One Treatment Leaches Saline Soils for Sugar Beet Production

One 10-hour treatment was sufficient to eliminate excess salts for sugar beet production in saline soils in cooperative tests recently made in the Yakima Valley by the Bureau, the Washington Experiment Station, and the Utah-Idaho Sugar Co.

R. W. Leamer reports, however, that observations made later in the season indicate that various methods of leaching may result in yield differences. The methods compared were preplanting flooding, furrow irrigation, and post-planting flooding. The first two require a source of water during winter because the leaching must be completed by mid-March if the beets are planted by the recommended date.

The post-planting leaching resulted in more of a relocation of the salts than removal. A special type of furrow opener was attached to the planter that made a small furrow about 4 inches from the beet row. Water entering the soil from this furrow tends to dilute the salts and move them downward and to the ridges between the rows. This is enough to permit germination of the seed, the period when beets are most susceptible to injury, and to hold the salt level down until the beet plant becomes established.

Cottons Collected in Mexico and Guatemala

Native cottons collected last spring in southern Mexico and southeastern Guatemala for use in Federal-State cotton breeding programs and by private breeders are now being grown at three locations. These are the Texas State Experiment Station, College Station, the Federal Experiment Station, Mayaguez, P. R.; and Shambat, Khartoum North, Anglo-Egyptian Sudan. At this last location the cottons are being tested by Dr. J. B. Hutchinson, the noted British geneticist.

Dr. J. O. Ware of the Division of Cotton and Other Fiber Crops and C. W. Manning of the Texas station made the collection in an expedition administered by the Division of Plant Exploration and Introduction and financed by RMA funds.

Rubber Not A Plant Food Reserve

Although rubber is found in thousands of plant species its function is obscure. Evidence recently obtained by Dr. H. M. Benedict supports Dr. H. P. Traub's wartime findings that rubber is not normally a food reserve.

Seedlings kept defoliated for nearly $4\frac{1}{2}$ months suffered high losses in carbohydrates and resins but no loss in rubber content. Of the carbohydrates, losses were 99 and 98 percent of levulin and inulin content, respectively. Resin losses in the stems and roots were 60 and 72 percent, respectively. The grams of rubber per plant remained constant through the experiment.

Nitrogen Restored in Tropical Soils

Evidence that the nitrogen content of badly eroded soils can be restored in time if the soils are given proper treatment comes from a cooperative study conducted by the Soils Division of this Bureau, the Soil Conservation Service, and the Federal Experiment Station at Mayaguez, P. R.

In this study, R. M. Smith, joint project leader, reports that the nitrogen content of soil that had the upper 3 feet of the profile removed 8 years ago and had since been planted with a Kudzu and grass cover was compared with that of normal soil from sugarcane plots.

The findings show that while the nitrogen content of the denuded soil is somewhat lower than that of normal soil, the difference is not so great as might be expected. At a depth of 3 inches, nitrogen content of the denuded soil was 0.15 percent, that of the normal soil, 0.20 percent. This ranged down to a content of 0.05 percent nitrogen in the denuded soil and 0.08 percent in normal soil at depths of 18 to 36 inches.

Southland Tomato Seed Available

A recent check indicates that 2,240 pounds of seed of the new Southland tomato will be available for sale this winter. Firms offering the seed for sale are:

Associated Seed Growers, Inc., New Haven, Conn.
Corneli Seed Co., St. Louis, Mo.
Farmer Seed & Nursery Co., Fairbault, Minn.
Kilgore Seed Co., Plant City, Fla.
T. W. Wood & Sons, Richmond, Va.
F. H. Woodruff & Sons, Milford, Conn.

The Southland, which was developed by C. F. Andrus at the Regional Vegetable Breeding Laboratory, Charleston, S. C., has a good record for productiveness in seven Southeastern States and gives promise of being useful for canning, shipping, and home gardens. Tested by cooperators at many experiment stations, the new tomato is hardy and disease resistant. It has shown high resistance to fusarium wilt and considerable resistance to late blight, early blight, collar rot, blossom end rot, puffiness, and scald.

Confer On Research With Radioactive Materials

Expansion of field tests with radioactive materials, particularly phosphorus, to include several States in addition to five States where work was done this year was discussed at a meeting of soil scientists of the Bureau and 17 State Experiment Stations and representatives of the Atomic Energy Commission at Beltsville, November 29-December 2. The conference reviewed cooperative work this past year in New York, North Carolina, Georgia, Iowa, and Colorado. States also represented at the meeting were: Pennsylvania, Maryland, Virginia, North Carolina, Florida, Mississippi, Texas, Ohio, Indiana, Missouri, Wisconsin, and California.

Effects of Phosphorus on Orange Trees Noted

A high level of phosphatic fertilizer on mature Valencia orange trees for a period of more than 6 years tends to lower the total solids, citric acid, and ascorbic acid content of the fruit with a resulting lowering in the quality and dietetic value of the fruit juice.

That is one of the findings in a study of the effects of four rates of phosphate fertilization on orange trees grown in Florida sandy acid soils. Dr. Walter Reuter, Dr. F. E. Gardner, Dr. P. F. Smith, and Dr. W. R. Roy are conducting the research. One experiment with mature Valencia trees has been running for 6 years. Another was started 4 years ago with newly planted trees of the Pineapple variety.

The phosphate treatments have caused no differences in total yields so far. There is some indication that high levels depressed trunk growth of Valencia but not of the Pineapple trees. Heavy phosphate fertilization has been associated with leaf accumulation of phosphorus, zinc, magnesium, and possibly calcium and with decrease in copper and possibly magnesium. It has had no effect on the nitrogen, potassium, sodium, boron, or iron content of the foliage.

Most of the applied phosphate can be accounted for in the topsoil by determination of total phosphorus. The rates of application are further reflected in determinations of water-soluble and acid-available phosphorus.

Winter Injury in Tung Related to Lack of Potash

The association of winter injury in older tung trees with very serious potash deficiency symptoms is noted in a survey made by Dr. Marshall S. Neff, Fruit and Vegetable Crops and Diseases at Fort Valley, Ga. He believes that correction of the deficiency will lessen susceptibility of the trees to winter injury. He noted zinc deficiency symptoms in the younger trees. The tung trees surveyed in this study are trial plantings made by peach growers to find whether the soil and climate at Fort Valley are suitable for diversifying with this crop.

Grapes Adapted to Yuma Mesa

Joseph Hamilton of the Division of Soil Management and Irrigation is preparing a research report on fertilizer requirements in the production of Thompson seedless grapes in the Yuma Mesa of Arizona.

This variety appears well adapted as a special crop on the Mesa, the findings show. The first crop of any size was obtained from rooted vines planted in March 1946. It was harvested June 20-21, 1948, which is the time the variety is also harvested in the Coachella Valley of California. It is believed the average season on the Mesa would be a few days earlier. With moderate fertilizer applications the vines have made excellent growth.

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NEW PROJECTS

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Resistant Spinach Varieties in the Making

A project to develop spinach varieties resistant to white rust, downy mildew, and other diseases and suitable for canning and fresh shipping has been inaugurated by the Division of Fruit and Vegetable Crops and Diseases, the Wisconsin and Texas Agricultural Experiment Stations, and the American Refrigerator Transit Co. of St. Louis, Mo. Dr. Henry A. Jones is in charge of the work for the Division. The studies will be conducted at Beltsville, Md., Winter Haven and Crystal City, Tex., and Madison, Wis.

The research will include a study of the life history of the white rust fungus in relation to moisture, temperature, and other factors for its development. Methods will be developed for making artificial inoculations so that large progeny populations can be tested in a short time in the seedling stage.

Poultry Calorimeter

Ten New Hampshire Red pullets are getting acclimated to special living quarters in one of the poultry laboratories at Beltsville. They occupy one of the two calorimeters installed by the Division of Farm Buildings and Rural Housing in cooperation with the Poultry Division of BAI.

The test unit, located in a temperature controlled room, has isothermal walls of sheet copper. These are surrounded by an insulated wall with thermostatically controlled heating and cooling coils between.

The first test to be run on the hens will measure heat and moisture production and feed consumption at 60° F. and an approximate relative humidity of 70 percent. Later the temperature will be lowered by other environmental factors kept constant for further tests.

Fruit Sorting and Packing Plants Studied in Michigan

A new project to study fruit sorting and packing plants, especially apple, has been initiated by the Division of Mechanical Processing of Farm Products in cooperation with the Michigan Agricultural Experiment Station and State College.

One objective is to locate bottlenecks in processing. Another is to note operations in which the fruit is bruised. Since September, H. P. Gaston, employed jointly by the Bureau and the State, has studied some 20 plants.

Recommendations for plant lay-out specifications and changes in equipment designed both for efficiency and to minimize bruising will be based on his findings.

* NOTES ON PERSONNEL *

New Assignments for Forage Leaders

Dr. O. S. Aamodt, Dr. Will M. Myers, and Dr. H. M. Tysdal, all leaders in forage research, are taking new assignments in the Bureau within the near future.

At his request Dr. Aamodt is relinquishing the administrative duties he has held for the past 10 years as head of the Division of Forage Crops and Diseases to return to full-time research. An opportunity to do this came when Dr. Tysdal, leader of the alfalfa project, requested a transfer to the Division of Rubber Investigations to take charge of the program on guayule genetics and breeding. Dr. Aamodt will take up the work of alfalfa project leader, and Dr. Myers will succeed him as head of the Division.

Dr. Myers' scientific achievements together with other qualities of leadership mean that he will bring to the Division the same capacities for carrying forward the cooperative program that Dr. Aamodt has effectively demonstrated.

Dr. Myers, who joined the Bureau in 1937 shortly after receiving his Ph.D. from the University of Minnesota, is senior geneticist in charge of grass-breeding research at the U. S. Regional Pasture Laboratory. He served as agricultural consultant on MacArthur's staff in Tokyo from August 1946 to April 1947. During his 7 months' stay in Japan he conducted a survey of agricultural research and extension methods in that country. During the past year he has completed a survey of grass-breeding research in the United States.

In transferring from leadership of the Alfalfa project to leadership of the program on guayule genetics and breeding, Dr. Tysdal is leaving a field of activity where his accomplishments have been outstanding. The new work will offer an opportunity not only to develop new and valuable materials but also principles of inheritance and breeding techniques offered by very few other economic plants. He will conduct a comprehensive program of plant improvement with kok-saghys and other promising rubber-bearing plants. His new headquarters will be at Salinas, Calif.

Sayre Named Associate Head of Cotton Division

Dr. Charles R. Sayre, Jr. has been named associate head of the Division of Cotton and Other Fiber Crops and Diseases. He brings a broad knowledge of the problems of cotton and southern agriculture to the new assignment.

For the past 2 years Dr. Sayre has been superintendent of the Delta Branch Experiment Station, Stoneville, Miss. The program of this station centers in a comprehensive attack on cotton genetics; improvement; mechanization; fertilization; weed, disease, and insect control; general production problems; and factors of quality.

A native of Illinois, a graduate of the University of Illinois and of Harvard, Dr. Sayre joined the Department in 1939 as an agricultural economist. He was in charge of a research project in farm management and costs in the Southeast until the war when he served as a communications officer in the navy.

Distinguished Service to American Agriculture

Edgar S. McFadden, agronomist in the Division of Cereal Crops and Diseases, stationed at College Station, Tex., has received another citation. This one, in recognition for his "distinguished service to American agriculture," was presented by the American Agricultural Editors Association meeting in Chicago, December 1.

Mr. McFadden has worked more than 30 years to develop disease-resistant varieties of small grains for growing conditions from the Gulf coast to the Canadian border. Hope wheat, which he developed from a cross of Vernal emmer and Marquis bread wheat, was the first successful transfer of the rust resistance of Vernal emmer, a tough, fibrous, worthless feed wheat, to the bread wheats. Hope wheat has been used extensively in wheat breeding programs throughout the world.

Since 1935, Mr. McFadden has been instrumental in developing several rust-resistant varieties of wheats and oats. Among these are Austin and Seabreeze wheats. Austin wheat is now planted on over a million Texas acres. Much of it is on land that could not grow wheat before because of rusts. The Seabreeze variety extends the Texas wheat belt to the Rio Grande and Gulf waters. Mr. McFadden has also developed improved varieties of flax, now a major cash crop in southern Texas.

Mr. McFadden has received many distinguished awards in the past few years. One, with a check for \$2,500, was given in 1946 by Reader's Digest for "his exceptionally meritorious contribution to public welfare through making it possible for millions of people to have food."

Webster, S. D., his birthplace, held an "Edgar McFadden Day," October 16, 1947, at which was unveiled a large granite and bronze monument crediting him with being "a creator and benefactor of mankind."

The Texas Chemurgic Council awarded McFadden a citation of merit in 1947. He was recently named a Fellow in the American Society of Agronomy.

Winston, Harding, Ramsey Take Part in Conferences

J. R. Winston and Dr. P. L. Harding of the Orlando, Fla., laboratory recently testified in hearings held in Florida by a subcommittee of the Senate Small Business Committee to consider ills of the citrus industry. They have also taken part in various conferences and hearings called by Governor-elect Fuller Warren on the proposed changes in Florida citrus maturity laws.

Mr. Winston and Dr. G. B. Ramsey of the Chicago laboratory assisted in a training conference for freight claim agents, agricultural agents, and other representatives of the railroads in the Southeastern States at the University of Florida, November 8-10.

Smith and Redit Testify Before ICC

Bureau findings in extensive tests on the transportation of apples and pears from the Pacific Northwest were presented by Edwin Smith and Walter H. Redit before an Interstate Commerce Commission hearing in Seattle, October 25 and 26. The hearing dealt with ICC protective service orders on winter shipments of the fruit. The 114-page illustrated report by the Bureau covering 6 tests with 51 cars was made a part of the record.

During the past 2 years, Smith and Redit have conducted a study to find methods of protecting the fruit from freezing without overheating during transit. They tested eight new types of thermostatically controlled alcohol and charcoal heaters developed as a result of earlier work in the Bureau.

On the basis of their findings, they recommend the use of thermostatically controlled nonfan heaters in cars equipped with air-circulating fans. This equipment provides uniform temperatures and prevents overheating of fruit on the top of the load. In the old type nonfan car, the thermostatically controlled charcoal heaters operated under present rules (based on outside air temperatures) provided almost as satisfactory protection as the fully automatic alcohol heaters.

Lefebvre Returns from Alaska

Returning from 5 months in Alaska, where he conducted a plant disease survey, Dr. C. L. Lefebvre reports serious losses from blackleg and ring rot in potatoes stored in the Anchorage and Fairbanks districts. He also observed ring rot on potatoes in the Matanuska Valley. These losses from disease have an important bearing on Alaskan agriculture because potatoes are the farmers' main cash crop.

Dr. Lefebvre found other vegetable crops grow well and are comparatively free of disease. In other crops, he noted the smuts of oats, barley, and wheat in most fields. The most striking disorder he observed was a physiological one--the gray speck of oats caused by a deficiency of manganese. Dr. Lefebvre collected more than 300 mycological specimens representing bacterial and fungus diseases of grasses and legumes.

Hawthorn Helps Establish New College Course

Leslie R. Hawthorn, Fruit and Vegetable Crops and Diseases, is assisting Dr. L. H. Pollard in establishing a new course in Vegetable and Flower Seed Production at Utah State College. This is in addition to the official cooperative research on vegetable seed production conducted at the Utah station. So far as known this is the second course of the kind to be offered in the United States. The first was given last year at the Idaho College of Agriculture.

Retirements

Mrs. Bessie E. Etter, scientific aide, Division of Forest Pathology, November 30, after more than 30 years of service.

Miss Mary G. Van Meter, administrative assistant, Division of Mycology, November 30, after 33 years of service.

 * ADMINISTRATIVE NOTES *

Cash Awards for Suggestions

The program, begun during the war, to improve government operations through employee suggestions is still in force. Every employee is eligible to take part and is urged to do so.

Any suggestion for speeding up routing operations, saving money, conserving property, improving working conditions and service to the public, if adopted, makes the employee offering it eligible for a cash award. This may range from \$10 to \$1,000. Former employees are eligible for awards for suggestions made while in service of the Department. Awards will not be made, of course, for suggestions normally expected in line of duty, such as those dealing with projects or specific assignments.

During the time the program has been in existence, 9 Bureaus of the Department have granted 29 awards to 31 employees. These include two joint awards.

Must Buy From Federal Supply Stores

Business officers of all Divisions are reminded that, with certain authorized exceptions, they are now required to buy all articles listed in stock catalogs of the Bureau of Federal Supply from Federal Supply Stores. An attachment to Business Services Memorandum No. 367, November 5, 1948, gives items excluded from the mandatory provision.

Prices have been stabilized under new procedure and will remain uniform within a given geographical area for a period of not less than 3 months. This should minimize accounting and fiscal problems, which have risen in the past. Price zones now set up are: No. 1, States from the Atlantic coast to the Mississippi River; No. 2, States from the Mississippi River to the Rockies; and No. 3, States west of the Rockies to the coast and Alaska.

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